

CLAIMS

What is claimed is:

1. A method of forming a weldable conduit for transporting fluids comprising the steps of: positioning a tube formed of a material having desirable properties within a pipe formed of a commonly weldable material such that one end of the tube is aligned with one end of the pipe, the tube having an outer diameter slightly less than the inner diameter of the pipe; affixing the tube to the pipe by connecting the aligned ends thereof; and compressing the pipe in a reducing operation so that the inner diameter of the pipe is reduced to a diameter that is less than or equal to the outer diameter of the tube.
2. The method of claim 1, wherein the tube is formed of a material having desirable corrosion-resistant and erosion-resistant properties.
3. The method of claim 1, wherein the pipe is formed of a carbon steel.
4. The method of claim 3, wherein the pipe is formed of a carbon steel selected from the group of steels having an API designation of 5L and steels having an ASTM designation of A106.
5. The method of claim 1, wherein the tube is formed of a stainless steel.
6. The method of claim 1, wherein the tube is formed of an alloy containing one or more materials selected from the group of chromium, molybdenum, nickel, iron, copper, and titanium.
7. The method of claim 1, wherein the tube is formed of an alloy selected from the group of stainless steel, hastelloy, inconel, incoloy, and monel.

8. The method of claim 1, wherein the tube is affixed to the pipe by tack welding the aligned ends thereof together.
9. The method of claim 1, wherein the tube is affixed to the pipe by clamping the aligned ends thereof together.
10. The method of claim 1, wherein the reducing operation includes rolling the pipe.
11. The method of claim 1, wherein the reducing operation includes forcing the pipe through a die.
12. A weldable conduit for transporting fluids, comprising:
an inner tube formed of a material having desirable properties,
an outer pipe formed of a commonly weldable material,
the pipe encircling and being compressed upon the tube such that the inner surface of the pipe engages the outer surface of the tube.
13. The method of claim 12, wherein the tube is formed of a material having desirable corrosion-resistant and erosion-resistant properties.
14. The conduit of claim 12, wherein the pipe is formed of a carbon steel.
15. The conduit of claim 14, wherein the pipe is formed of a carbon steel selected from the group of steels having an API designation of 5L and steels having an ASTM designation of A106.
16. The conduit of claim 12, wherein the tube is formed of a stainless steel.
17. The conduit of claim 12, wherein the tube is formed of an alloy containing one or more materials selected from the group of chromium, molybdenum, nickel, iron, copper, and titanium.

18. The conduit of claim 12, wherein the tube is formed of an alloy selected from the group of stainless steel, hastelloy, inconel, incoloy, and monel.
19. The conduit of claim 12, wherein the pipe is compressed upon the tube by a reducing operation.
20. The conduit of claim 19, wherein the reducing operation includes rolling the pipe.
21. The conduit of claim 19, wherein the reducing operation includes forcing the pipe through a die.
22. A method of forming a conduit assembly for transporting fluids, comprising the steps of:
forming a pair of weldable conduits, each of the conduits being formed by:
positioning a tube formed of a material having desirable properties within a pipe formed of a commonly weldable material such that one end of the tube is aligned with one end of the pipe, the tube having an outer diameter slightly less than the inner diameter of the pipe;
affixing the tube to the pipe by connecting the aligned ends thereof; and
compressing the pipe in a reducing operation so that the inner diameter of the pipe is reduced to a diameter that is less than or equal to the outer diameter of the tube;
and
positioning the conduits in opposing relation and placing an end of each of the conduits about the respective opposing ends of a coupling for welded interconnection of the conduits, the coupling including:
a cylindrical body formed of the same material as the tubes of the conduits, the body having:
an outer diameter that is slightly less than the inner diameter of the tubes of the conduits, and
a circumferential recess intermediate the ends of the body, and

a ring formed of the same material as the pipes of the conduits, the ring being positioned within the recess of the body and having a circumferential stop means for limiting movement of the ends of the body within the respective ends of the conduits by the ends of the conduits abutting the stop means; and at least one circumferential seal intermediate the recess and each of the tapered ends of the body for sealing the interconnected conduits; temporarily affixing the ends of the conduits to one another in the region of the circumferential stop means of the ring; removing the circumferential stop means of the ring to clear an annular pathway for welded interconnection of the ends of the conduits; and welding the ends of the conduits together in the annular pathway.

23. The method of claim 22, wherein the tube of each conduit is formed of a material having desirable corrosion-resistant and erosion-resistant properties.
24. The method of claim 22, wherein the pipe of each conduit is formed of a carbon steel.
25. The method of claim 24, wherein the pipe of each conduit is formed of a carbon steel selected from the group of steels having an API designation of 5L and steels having an ASTM designation of A106.
26. The method of claim 22, wherein the tube of each conduit is formed of a stainless steel.
27. The method of claim 22, wherein the tube of each conduit is formed of an alloy containing one or more materials selected from the group of chromium, molybdenum, nickel, iron, copper, and titanium.
28. The method of claim 22, wherein the tube of each conduit is formed of an alloy selected from the group of stainless steel, hastelloy, inconel, incoloy, and monel.

29. The method of claim 22, wherein the tube of each conduit is affixed to the pipe by tack welding the aligned ends thereof together.
30. The method of claim 22, wherein the tube of each conduit is affixed to the pipe by clamping the aligned ends thereof together.
31. The method of claim 22, wherein the reducing operation includes rolling the pipe of each conduit.
32. The method of claim 22, wherein the reducing operation includes forcing the pipe of each conduit through a die.
33. The method of claim 22, wherein the cylindrical body of the coupling further has an inner diameter that varies to form a taper at each end of the body.
34. The method of claim 22, wherein the coupling further includes an insulator positioned in the recess between the ring and the body for inhibiting the transfer of heat produced by welding the ends of the conduits together.
35. A conduit assembly for transporting fluids, comprising:
a pair of opposing composite conduits each including:
an inner tube formed of a material having desirable properties,
an outer pipe formed of a commonly weldable material,
the pipe encircling and being compressed upon the tube such that the inner surface of the pipe engages the outer surface of the tube; and
a coupling for welded interconnection of the opposing conduits, the coupling including:
a cylindrical body formed of the same material as the tubes of the conduits, the body having:
an outer diameter that is slightly less than the inner diameter of the tubes, and
a circumferential recess intermediate the ends of the body, and

a ring formed of the same material as the pipes of the conduits, the ring being positioned within the recess of the body and having a circumferential stop means for limiting movement of the ends of the body within the respective ends of the conduits by the ends of the conduits abutting the stop means; and at least one circumferential seal intermediate the recess and each of the tapered ends of the body for sealing the interconnected conduits.

36. The conduit assembly of claim 35, wherein the tube is formed of a material having desirable corrosion-resistant and erosion-resistant properties.
37. The conduit assembly of claim 35, wherein the pipe of each conduit is formed of a carbon steel.
38. The conduit assembly of claim 37, wherein the pipe of each conduit is formed of a carbon steel selected from the group of steels having an API designation of 5L and steels having an ASTM designation of A106.
39. The conduit assembly of claim 35, wherein the tube of each conduit is formed of a stainless steel.
40. The conduit assembly of claim 35, wherein the tube of each conduit is formed of an alloy containing one or more materials selected from the group of chromium, molybdenum, nickel, iron, copper, and titanium.
41. The conduit assembly of claim 33, wherein the tube of each conduit is formed of an alloy selected from the group of stainless steel, hastelloy, inconel, incoloy, and monel.
42. The conduit assembly of claim 35, wherein the cylindrical body of the coupling further has an inner diameter that varies to form a taper at each end of the body.

43. The conduit assembly of claim 35, wherein the coupling further includes an insulator positioned in the recess between the ring and the body for inhibiting the transfer of heat produced by welding the ends of the conduits together.
44. A conduit assembly for transporting fluids, comprising:
a pair of opposing composite conduits each including:
an inner tube formed of a material having desirable properties,
an outer pipe formed of a commonly weldable material, and
a flange connected to the pipe adjacent one of the pipe's ends,
the pipe encircling and being compressed upon the tube such that the inner surface of the pipe engages the outer surface of the tube; and
a coupling aligning the opposing conduits for flanged interconnection, the coupling including:
a cylindrical body formed of the same material as the tubes of the conduits, the body having:
an outer diameter that is slightly less than the inner diameter of the tubes, and
a circumferential recess intermediate the ends of the body,
a central seal positioned at least partially within the recess of the body; and
at least one circumferential seal intermediate the recess and each of the tapered ends of the body for sealing the interconnected conduits.
45. The conduit assembly of claim 44, wherein the tube is formed of a material having desirable corrosion-resistant and erosion-resistant properties.
46. The conduit assembly of claim 44, wherein the pipe of each conduit is formed of a carbon steel.
47. The conduit assembly of claim 46, wherein the pipe of each conduit is formed of a carbon steel selected from the group of steels having an API designation of 5L and steels having an ASTM designation of A106.

48. The conduit assembly of claim 44, wherein the tube of each conduit is formed of a stainless steel.
49. The conduit assembly of claim 44, wherein the tube of each conduit is formed of an alloy containing one or more materials selected from the group of chromium, molybdenum, nickel, iron, copper, and titanium.
50. The conduit assembly of claim 44, wherein the tube of each conduit is formed of an alloy selected from the group of stainless steel, hastelloy, inconel, incoloy, and monel.
51. The conduit assembly of claim 44, wherein the cylindrical body of the coupling further has an inner diameter that varies to form a taper at each end of the body.
52. The conduit assembly of claim 44, wherein the recess of the coupling body is positioned at the location of flanged interconnection between the opposing conduits.
53. The conduit assembly of claim 44, further comprising a gasket disposed on a face of the flange of each conduit, the gasket being formed of the same material as the tube of each conduit.